What is claimed is:

1. An axial piston machine, in particular, an air-conditioner compressor for motor vehicles, including at least one piston 1, 40, 101 having a substantially cylindrical piston body 3, 42, 102 and a brace 5, 44, 104 that embraces a tilting ring 82 or a tilting plate 106 and piston shoes 105 sliding on said tilting ring 82 or on said tilting plate 106; the brace 5, 44, 104 having spherical cap-shaped depressions 15,17, 54, 62 for receiving the piston shoes 105, said depressions being located on the side of the piston body and on the opposite side,
wherein the brace 5, 44 has an opening 9, 46 in its side opposite the piston body 3, 42.

2. The axial piston machine as recited in Claim 1,
wherein the axis 11 of the opening 9 coincides with the axis 13, 50 of the piston body 3, 42.

3. The axial piston machine as recited in Claim 1 or Claim 2,
wherein the opening 9 is substantially cylindrical.

4. The axial piston machine as recited in Claims 1 through 3,
wherein a tool 48, 60 for machining the spherical cap-shaped depressions 15,17, 54, 62 in the brace 5, 44 can be introduced through the opening 9.

5. The axial piston machine as recited in one of the preceding claims,
wherein the machining motion for producing the spherical shape of the spherical cap-shaped depressions 15,17, 54, 62 can be produced by rotating the piston 1, 40 about the axis 13, 50 of the piston body 3, 42, that is, about the cylinder axis.

6. The axial piston machine as recited in one of the preceding claims,
wherein the machining can be carried out by turning on standard lathes.

7. The axial piston machine as recited in one of the preceding claims,
wherein the piston 1, 40 is provided with a centering hole or a centering center 56 or a weight-reduction hole on the piston body side of the brace 5, 44 which is opposite the opening side of the brace 5, 44.

8. The axial piston machine as recited in one of the preceding claims, wherein a coating of the piston 1, 40 can be machined on lathes and grinding machines in a very stable chucking position by means of the centering center 56.

9. The axial piston machine as recited in one of the preceding claims, wherein the spherical cap-shaped depressions 15, 17, 54, 62 can be produced using tools with reversible inserts having a ready-made spherical contour.

10. The axial piston machine as recited in one of the preceding claims, wherein the piston 1, 40, 101 can be manufactured as a single, solid piece from an aluminum material.

11. The axial piston machine as recited in the preamble of Claim 1, wherein a first spherical recess 80 is disposed within the bridge of the brace 5, 44, that is, in the inner radial region of the piston brace 5, 44.

12. The axial piston machine as recited in Claim 11, wherein the first spherical recess 80 can be produced by rotating the piston 1, 40 about its cylinder axis 13, 50 with the tool 92 rotating during the machining of the spherical shape in the brace 5, 44.

13. The axial piston machine as recited in Claim 11, wherein the first spherical recess 80 can be produced by rotating the piston 1, 40 about an axis extending perpendicular to its cylinder axis 13, 50 without the tool rotating during the machining of the spherical shape in the brace 5, 44.

14. The axial piston machine as recited in Claim 11, wherein the spherical running surfaces 54, 62 of the piston shoes 105 in the brace 5, 44 merge seamlessly into the first spherical recess 80 in the bridge of the brace 5, 44, and the spherical running surfaces 54, 62 and the first spherical recess 80 preferably have equal sphere radii.

15. The axial piston machine as recited in Claims 11 through 14,
wherein the bridge of the brace 5, 44 is adapted, on its inner side, to the contour 84 of the tilting ring 82, or of the tilting plate, respectively, by a second spherical recess 81 of larger radius outside the first spherical recess 80.

16. The axial piston machine as recited in Claims 11 through 15,
wherein the second spherical recess 81 allows the bridge of the brace 5, 44 to be shifted as close as possible to the tilting ring 82 or to the tilting plate, respectively.

17. The axial piston machine as recited in Claims 11 through 16,
wherein due to the second spherical recess 81, the bending line of the brace 5, 44 is so close to the tilting plate or to the tilting ring 82, respectively, that the stiffness against bending during the suction movement is only slightly reduced compared to a brace without a first spherical recess.

18. The axial piston machine as recited in the preamble of Claim 1,
wherein the substantially cylindrical piston body 3 and the brace 5 are two separate parts from which the piston 1 can be assembled.

19. The axial piston machine as recited in one of the preceding claims,
wherein the brace 5 can be made from a strip of sheet metal, and the piston body 3 can be made as a deep-drawn part of sheet metal, and the brace 5 is connectable to the cylindrical piston body 3.

20. The axial piston machine as recited in one of the preceding claims,
wherein the opening 9 in the brace 5 can be made by punching.

21. The axial piston machine as recited in one of the preceding claims,
wherein the seatings 15, 17 of the piston shoes 105 can be produced or largely preformed during the forming process of the brace 5.

22. The axial piston machine as recited in one of the preceding claims,
wherein both the brace 5 and the piston body 3 can be made from a steel material.

23. The axial piston machine as recited in one of the preceding claims,
wherein the brace 5 and the piston body 3 can be joined together by laser welding or resistance welding.

24. The axial piston machine as recited in one of the preceding claims,
wherein a hollow space between the brace 5 and the piston body 3 is airtight, or nearly airtight.

25. The axial piston machine as recited in one of the preceding claims,
wherein a coating is applied to the piston 1 after the brace 5 and the piston body 3 are assembled together; a phosphate coating being able to be applied as an adhesive base in a layer thickness of about 2-3 μm, and a PTFE coat being able to be applied as a second layer in a layer thickness of about 10 μm.

26. The axial piston machine as recited in the preamble of Claim 1,
wherein the outer side, as a sliding surface 109, of the brace 104 has at least one opening 111 to the inner radial region of the brace 104 which faces the tilting plate or the tilting ring 106.

27. The axial piston machine as recited in Claim 26,
wherein the at least one opening 111 serves to supply lubricant to the sliding surface 109.

28. The axial piston machine as recited in one of the preceding claims,
wherein the peripheral region of the piston brace 104 which is designed as a sliding surface 109 has several and/or differently shaped openings 111 or opening regions.

29. The axial piston machine as recited in one of the preceding claims,
wherein the peripheral region of the brace 104 which is designed as a sliding surface 109 has formed therein pocket-shaped regions 116 opposite the drive mechanism housing wall 108 which serves as a running surface, said pocket-shaped regions being supplied via the at least one lubrication opening 111.